WHAT IS CLAIMED IS:

1. An integrated electro-optic circuit comprising:

a semiconductor substrate composed of a material suitable for use as a detector of a predetermined signal wavelength;

an electronic circuit layer positioned on the semiconductor substrate;

a buffer layer positioned on the electronic circuit layer;

a waveguide layer, including a waveguide, positioned on the buffer layer, the waveguide layer being formed of phosphate glass doped with an amplifying material; and

a cladding layer positioned on the waveguide layer,

wherein an index of refraction of the waveguide layer is greater than an index of refraction of the buffer layer and greater than an index of refraction of the cladding layer.

2. The electro-optic circuit of claim 1, wherein the electronic circuit layer includes an electro-optic element for receiving a signal from the waveguide layer.

3. The electro-optic circuit of claim 2, wherein the electro-optic element is an optical sensor for detecting a coupling signal comprising a portion of a photonic communication signal propagating in the waveguide layer.

4. The electro-optic circuit of claim 3, further comprising a light signal tap for directing the coupling signal towards the sensor.

5. The electro-optic circuit of claim 4, wherein the light signal tap includes a region of the buffer layer having an increased index of refraction with respect to the index of refraction of the buffer layer, such that a predetermined portion of the photonic communication signal forms the coupling signal.

6. The electro-optic circuit of claim 4, wherein the light signal tap includes a region of the buffer layer comprising a periodic grating, such that a predetermined portion of the photonic communication signal forms the coupling signal.

7. The electro-optic circuit of claim 4, wherein the light signal tap includes a region of the buffer layer comprising a photovoltaic material, such that a predetermined portion of the photonic communication signal forms the coupling signal when a minimum electric potential is present across the region.

8. The electro-optic circuit of claim 4, wherein the light signal tap includes a region of the buffer layer comprising a thermo-optic material, such that a predetermined portion of the photonic communication signal forms the coupling signal when the region exceeds a minimum temperature.

9. The electro-optic circuit of claim 3, wherein the amplifying material comprises erbium.

10. The electro-optic circuit of claim 9, wherein the amplifying material further comprises ytterbium.

11. The electro-optic circuit of claim 1, wherein the material comprises gallium aluminum arsenide and the predetermined signal wavelength is between about 1100 nm and about 1600 nm.

12. The electro-optic circuit of claim 1, wherein the material comprises silicon and the predetermined signal wavelength is les than about 1100 nm.

13. The electro-optic circuit of claim 1, wherein the material comprises germanium and the predetermined signal wavelength is greater than about 2000 nm.

14. A method of manufacturing an integrated electro-optic circuit comprising the steps of:

obtaining a semiconductor substrate suitable for a predetermined signal wavelength of operation;

providing an integrated circuit, including an optical signal detecting electrical element, on the substrate;

depositing a buffer on the substrate;

depositing a phosphorous-based glass doped with at least one amplifying material on the buffer;

forming a buried waveguide channel in the phosphorous-based glass; and

depositing a cladding on the phosphorous-based glass,

wherein the index of refraction of the phosphorous-based glass is greater than the index of refraction of the cladding and greater than the index of refraction of the buffer.

15. The method of claim 14 further comprising a step of providing a mechanism for generating and directing a coupling signal to the optical interfacing element.

16. The method of claim 14 further comprising a step after step (d) of consolidating the phosphorous-based glass.

17. The method of claim 16, wherein the at least one amplifying material comprises erbium.

18. The method of claim 17, wherein the at least one amplifying material further comprises ytterbium.

19. The method of claim 18, wherein the step (d) is performed by plasma enhanced chemical vapor deposition.

20. The method of claim 14, wherein the step (d) is performed by a sol-gel process.

21. The method of claim 14, wherein the step (e) is performed by chemical etching.

22. The method of claim 14, wherein the step (e) is performed by ultraviolet masking.